

**What is claimed is:**

1           1. A liquid crystal display with an integrated  
2 color filter, comprising:  
3           an active matrix substrate with a plurality of  
4           switching elements;  
5           an insulating layer formed on the active matrix  
6           substrate;  
7           a double-organic layer formed on the insulating  
8           layer;  
9           a plurality of pixel electrodes formed on the  
10          double-organic layer, and electrically  
11          connected to the respective switching  
12          elements via a plurality of respective  
13          contact holes;  
14          a substrate positioned a predetermined distance  
15          above the active matrix substrate; and  
16          a liquid crystal layer between the two  
17          substrates.

1           2. The liquid crystal display with an integrated  
2 color filter as claimed in claim 1, wherein the double-  
3 organic layer comprises a plurality of color-filter units  
4 and a transparent organic layer.

1           3. The liquid crystal display with an integrated  
2 color filter as claimed in claim 2, wherein the color-  
3 filter units layer is formed above the transparent  
4 organic layer.

1           4. The liquid crystal display with an integrated  
2 color filter as claimed in claim 2, wherein the  
3 transparent organic layer is formed above the color-  
4 filter units layer.

1           5. The liquid crystal display with an integrated  
2 color filter as claimed in claim 2, wherein the  
3 transparent organic layer is formed of polycarbonate or  
4 acrylic-resin.

1           6. The liquid crystal display with an integrated  
2 color filter as claimed in claim 2, wherein the light  
3 transmission of the transparent organic layer is above  
4 90%.

1           7. The liquid crystal display with an integrated  
2 color filter as claimed in claim 2, wherein the  
3 dielectric constant of the transparent organic layer is  
4 2.6-3.6.

1           8. The liquid crystal display with an integrated  
2 color filter as claimed in claim 2, wherein the thickness  
3 of the transparent organic layer is 1.5-3.5 $\mu$ m.

1           9. The liquid crystal display with an integrated  
2 color filter as claimed in claim 2, wherein the  
3 dielectric constant of the color-filter units is 3.5-5.0.

1           10. The liquid crystal display with an integrated  
2 color filter as claimed in claim 2, wherein the thickness  
3 of the color-filter units is 1.0-2.0 $\mu$ m.

1           11. The liquid crystal display with an integrated  
2 color filter as claimed in claim 2, wherein the color-  
3 filter units includes red, green and blue units.

1           12. The liquid crystal display with an integrated  
2 color filter as claimed in claim 1, wherein the pixel  
3 electrodes are made of indium tin oxide.

1           13. The liquid crystal display with an integrated  
2 color filter as claimed in claim 1, wherein the contact  
3 holes pass through the insulating layer and the double-  
4 organic layer.

1           14. An integrated color filter, comprising:  
2           a substrate;  
3           a plurality of switching elements formed on the  
4           substrate in a matrix arrangement;  
5           an insulating layer formed on the switching  
6           elements;  
7           a transparent organic layer formed above the  
8           insulating layer;  
9           a plurality of color-filter units formed above  
10          the transparent organic layer; and  
11          a plurality of pixel electrodes formed above  
12          the color-filter units, and electrically  
13          connected to the respective switching  
14          elements via a plurality of respective  
15          contact holes, wherein the contact holes  
16          pass through the transparent organic  
17          layer, color-filter units and the  
18          insulating layer.

1           15. An integrated color filter, comprising:  
2           a substrate;  
3           a plurality of switching elements formed on the  
4           substrate in a matrix arrangement;  
5           an insulating layer formed on the switching  
6           elements;  
7           a plurality of color-filter units formed above  
8           the insulating layer;  
9           a transparent organic layer formed above the  
10          color-filter units; and  
11          a plurality of pixel electrodes formed above  
12          the color-filter units, and electrically  
13          connected to the respective switching  
14          elements via a plurality of respective  
15          contact holes, wherein the contact holes  
16          pass through the transparent organic  
17          layer, color-filter units and the  
18          insulating layer.

1           16. A method of fabricating an integrated color  
2          filter, comprising:  
3           providing a substrate;  
4           forming a plurality of switching elements on  
5           the substrate in a matrix arrangement;  
6           forming an insulating layer on the switching  
7           elements;  
8           forming a transparent organic layer on the  
9           switching elements, wherein the  
10          transparent organic layer has a first hole

11 exposing a part of the surface of the  
12 insulating layer;  
13 etching the insulating layer by using the  
14 transparent organic layer as an etching  
15 mask to form a second hole in the  
16 insulating layer, wherein the second hole  
17 joins the first hole and exposes a part of  
18 the surface of the switching elements;  
19 forming a plurality of color-filter units with  
20 a third hole on the transparent organic  
21 layer, wherein the third hole forms a  
22 contact hole together with the first and  
23 the second holes to expose the part of the  
24 surface of the switching elements; and  
25 forming a plurality of pixel electrodes on the  
26 color-filter units, wherein the pixel  
27 electrodes are electrically connected with  
28 the switching elements via the contact  
29 hole.

1 17. The method of fabricating an integrated color  
2 filter as claimed in claim 16, wherein the transparent  
3 organic layer is made of polycarbonate or acrylic-resin.

1 18. The method of fabricating an integrated color  
2 filter as claimed in claim 16, wherein the light  
3 transmission of the transparent organic layer is above  
4 90%.

1           19. The method of fabricating an integrated color  
2 filter as claimed in claim 16, wherein the dielectric  
3 constant of the transparent organic layer is 2.6-3.6.

1           20. The method of fabricating an integrated color  
2 filter as claimed in claim 16, wherein the thickness of  
3 the transparent organic layer is 1.5-3.5 $\mu$ m.

1           21. The method of fabricating an integrated color  
2 filter as claimed in claim 16, wherein the dielectric  
3 constant of the color-filter units is 3.5-5.0.

1           22. The method of fabricating an integrated color  
2 filter as claimed in claim 16, wherein the thickness of  
3 the color-filter units is 1.0-2.0 $\mu$ m.

1           23. The method of fabricating an integrated color  
2 filter as claimed in claim 16, wherein the color-filter  
3 units includes red, green and blue units.

1           24. The method of fabricating an integrated color  
2 filter as claimed in claim 16, wherein the pixel  
3 electrodes are made of indium tin oxide.

1           25. A method of fabricating an integrated color  
2 filter, comprising:

3                 providing a substrate;

4                 forming a plurality of switching elements on  
5                         the substrate in a matrix arrangement;

6                 forming an insulating layer on the switching  
7                         elements;

8                   forming a plurality of color-filter units with  
9                   a first hole on the insulating layer;  
10                  forming a transparent organic layer on the  
11                  color-filter units, having a second hole  
12                  to expose the first hole;  
13                  etching the insulating layer by using the  
14                  transparent organic layer as a mask,  
15                  forming a third hole in the insulating  
16                  layer to expose a part of the surface of  
17                  the switching elements, wherein the third  
18                  hole forms a contact hole together with  
19                  the first and the second holes; and  
20                  forming a plurality of pixel electrodes on the  
21                  transparent organic layer, wherein the  
22                  pixel electrodes are electrically  
23                  connected with the switching elements via  
24                  the contact hole.

1                  26. The method of fabricating an integrated color  
2                  filter as claimed in claim 25, wherein the transparent  
3                  organic layer is made of polycarbonate or acrylic-resin.

1                  27. The method of fabricating an integrated color  
2                  filter as claimed in claim 25, wherein the light  
3                  transmission of the transparent organic layer is above  
4                  90%.

1                  28. The method of fabricating an integrated color  
2                  filter as claimed in claim 25, wherein the dielectric  
3                  constant of the transparent organic layer is 2.6-3.6.

1           29. The method of fabricating an integrated color  
2 filter as claimed in claim 25, wherein the thickness of  
3 the transparent organic layer is 1.5-3.5 $\mu$ m.

1           30. The method of fabricating an integrated color  
2 filter as claimed in claim 25, wherein the dielectric  
3 constant of the color-filter units is 3.5-5.0.

1           31. The method of fabricating an integrated color  
2 filter as claimed in claim 25, wherein the thickness of  
3 the color-filter units is 1.0-2.0 $\mu$ m.

1           32. The method of fabricating an integrated color  
2 filter as claimed in claim 25, wherein the color-filter  
3 units includes red, green and blue units.

1           33. The method of fabricating an integrated color  
2 filter as claimed in claim 25, wherein the pixel  
3 electrodes are made of indium tin oxide.